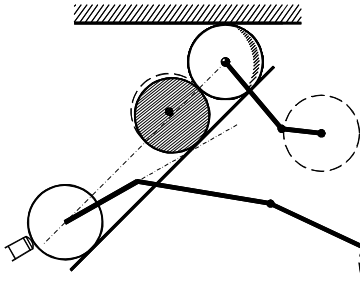


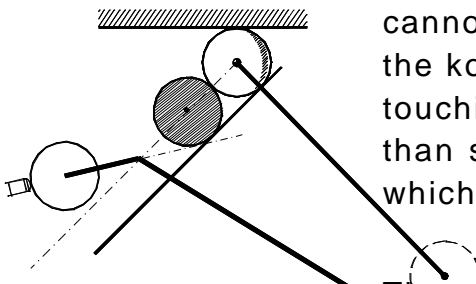
KISS CANNONS

KISS 1 ZERO DOGLEG



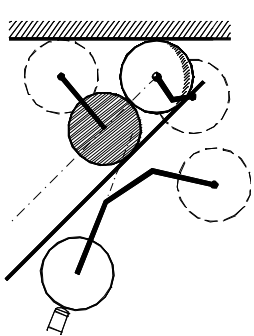
Az shown a soft $7/16^{\text{th}}$ kontakt givs a RRY kiss cannon & the 3 dotty balls show a perfikt leev giving us a halfball YR cannon for our 2nd shot (3rd will be a RY drive-gather)(4th will praps be a left-to-right nursery). The margin for error iz a $1/16^{\text{th}}$ ball thinner & thicker (ie kontakts tween $7/16^{\text{th}}$ & $9/16^{\text{th}}$ will skore), but for such an eezy pozzy u shood not be satisfied with the cannon unless the leev iz very good. I kall it a RRY cannon koz the kontakt on the red iz longer timewise than when the red aint touching the yellow. And if the red iz not touching but iz less than say $\frac{1}{2}$ mm klear then u might get a proper double kontakt which i would kall a RRY cannon.

KISS 2 DOGLEG LEFT



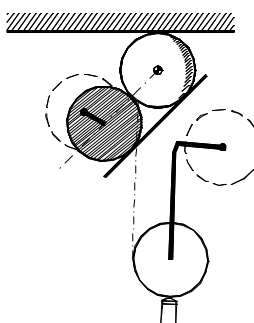
The qball iz left of the YR line. We need more pace than in Kiss 1 koz the qball meets yellow a long way away. Aim exaktly halfball. The margin for error iz less than in Kiss 1 & u are happy to get the cannon, & the leev iz allways iffy at that range.

KISS 3 DOGLEG RIGHT



The qball iz right of the YR line. Best kontakt the red $5/8^{\text{th}}$ ball az shown, else the qball might end up snookered by the yellow. The margin for error iz larger than in Kiss 1. Az shown by the dotty balls your next shot here kan be a soft stunny YR cannon to praps leev a left to right nursery.

KISS 4 DIREKT



We kan see enuff of the yellow to play a thin direkt cannon az shown. No kiss cannon needed. Warning: we need to see at least $1/8^{\text{th}}$ of the yellow (more than u think).

R-Y RR-Y R-R-Y & RR-R-Y KISS CANNONS

RY CANNONS In billiards most cannons are simple RY cannons, ie the qball hits the red once & then travels some distance & hits the yellow. In this chapter the red iz uzually the first ball (ie a RY cannon). If the qball hits the red then a cushion then the yellow i kall that a RcY cannon.

KISS CANNONS If the red hits the yellow before the qball hits the yellow then that iz a kiss cannon. It iz a RY cannon anyhow.

KISS CANNON THE ILLUSTRATED ENCYCLOPEDIA OF BILLIARDS, MIKE SHAMOS (1993). (Eng. Bill.) A CANNON made by reflecting the cue ball off a ball that is FROZEN to a rail. 1911 Roberts 208, 1935 Sith 51. In American usage, a KISS-BACK SHOT.

A cannon in which the first object ball forces the second into the cue ball to complete the COUNT. 1954 KTG 23, 1957 Holt 92.

The term "kiss carom" appears at 1879 NYT (Jan 29) 8:5. Cf. CHUCK NURSE.

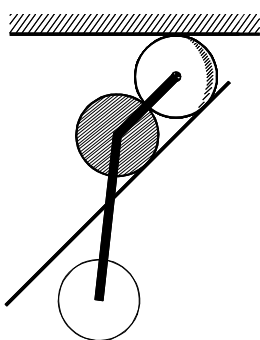
RRY KISS CANNONS When the qball hits a free-standing red it will be in kontakt for say 0.5 milliseconds. If the red is touching the yellow then the qball might be in kontakt for say 0.7 msec (& the red might be in kontakt with yellow for say 0.7 msec). Hence when the red is touching the yellow I like to call the kiss cannon a RRY kiss cannon to differentiate from a RY kiss cannon.

RRY KISS CANNONS If the red is almost touching the yellow then sometimes the qball can kontakt the red twice before the qball cannons on yellow, in which case I like to call it a RRY kiss cannon.

RRRY KISS CANNONS If the red is touching the yellow & if the yellow rebounds from a cush & hits the red then the qball might hit the red a second time giving a RRRY kiss cannon.

THE RED likewise kisses the yellow once or if near the cush two or three times. If the yellow is frozen on the cush then technically the red's kontakt on yellow must be a YY rather than YR coz the yellow sinks into the cush & then collides with the red on the way out. And if the red is touching the yellow which is frozen then it is a YYY. But we don't bother to describe the red's kontakts with yellow or the cush.

SLANTINDICULARITY 45L 39R (0,0,1)



KISS 5 Simple kiss cannons can be described by five key measurements. This here pozzys can be described as 45L 39R (0,0,1).

SLANT ANGLE The RY slantindicularity is 45dg from the face of the cush, from the left (45L).

DOGLEG ANGLE The QRY dogleg is 39dg from straight, & is to the right (39R).

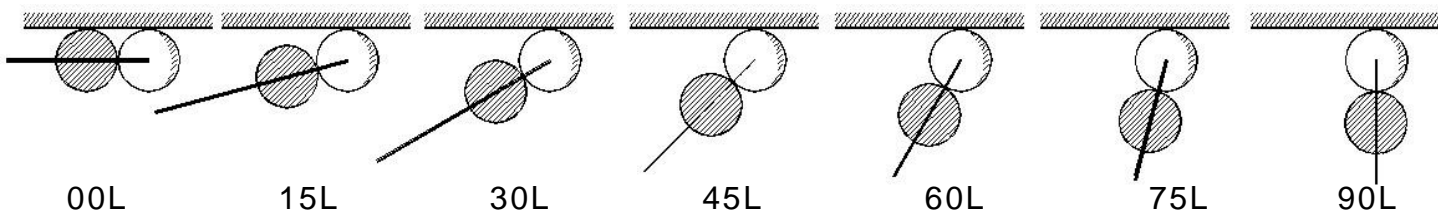
YELLOW GAP The yellow is frozen (0).

RED GAP The red is touching the yellow (0).

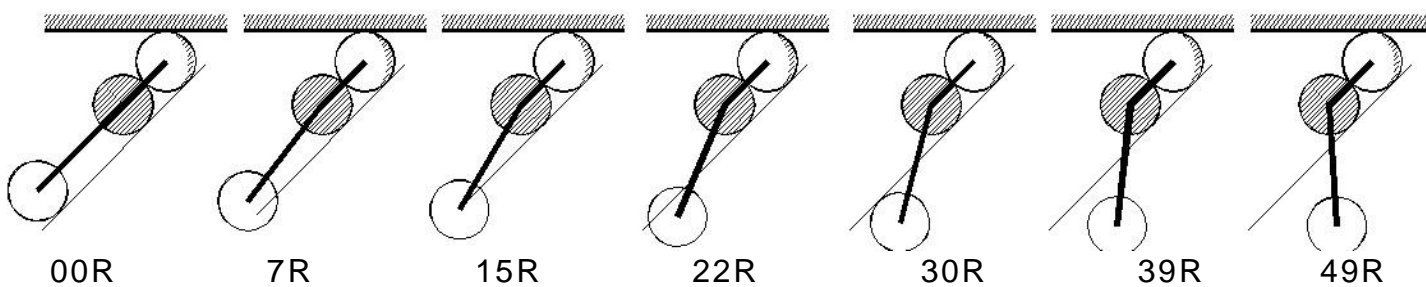
QBALL RANGE to the red is 1 ball klear (1).

910 STANDARD POZZYS

During nurserys & gathers the balls are not far apart & the infinite spectrum of possible pozzys can be reduced to 910 standard pozzys (ie 7 by 13 by 5 by 5 by 1). Plus we have the mirror images (ie slants to the right)(which we ignore here).



KISS 6 SEVEN SLANTS We can look at seven standard slants @ 15 deg increments to the left as shown. We can ignore the 6 mirror-images to the right.

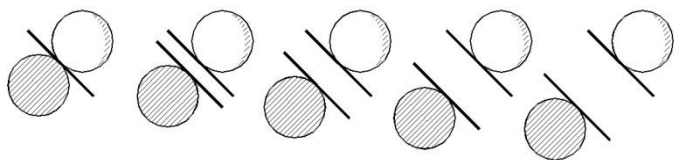
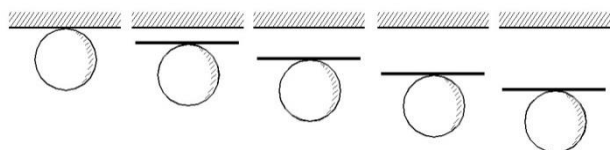


KISS 7 THIRTEEN DOGLEGS

For each slant we can look at 6 standard doglegs to the left & 6 to the right & one zero dogleg (00R). We could use 13 standard doglegs @ 7.5deg increments, covering an arc of 45deg left & 45deg right. But in Dia17 i show my preferred way, i move the qbball across a 1/4ball at a time, while keeping it 1ball klear of the red. This gives doglegs of 00deg, 7deg, 15deg, 22deg, 30deg, 39deg, & 49deg (not important).

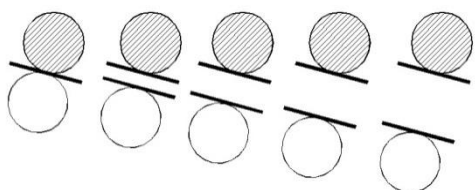
KISS 8 FIVE YELLOW GAPS

We can place the yellow in 5 standard pozzys up to 1ball klear off the cushion in 1/4ball increments as shown.



KISS 9 FIVE R-TO-Y GAPS

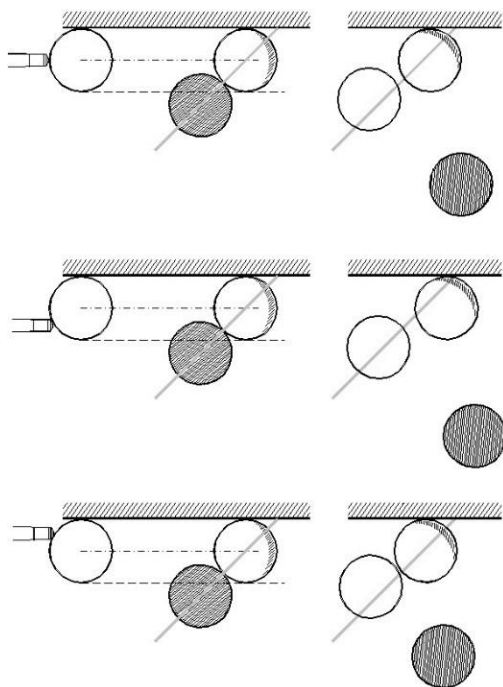
We can place the red in 5 standard pozzys up to 1ball klear from the yellow in 1/4ball increments as shown.



KISS 10 ONE QBALL-TO-RED RANGE

I like to have the qbball 1ball klear of the red. But the main consideration is the aim-line, range rarely matters. If aiming halfball on red i can move the qbball in or out along that aim-line without affecting the kiss cannon.

45L 66L (0,0,1)



KISS 11

Six ways of playing a RRcRY kiss cannon in this pozzys (qbball frozen).

11A Plainball (5/16th).

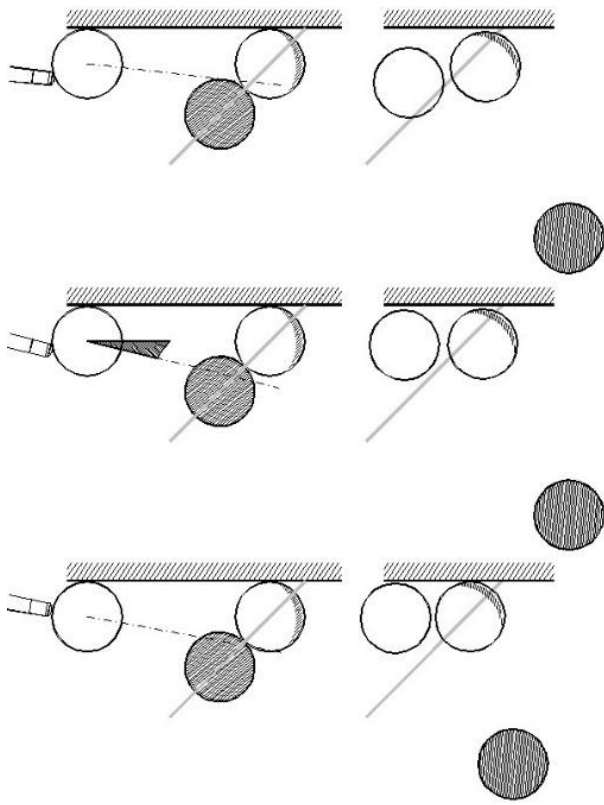
A typical leev is shown on the right. Not much good for nurserys.

11B Right Hand Side.

The leev doesnt look good.

11C Left Hand Side.

Using lhs woz of no value here. The best leev u can get is the poor leev shown, & here i hav hit softish & risked not reaching the yellow. Had i hit hardish to reduce that risk then the leev would be even worse.

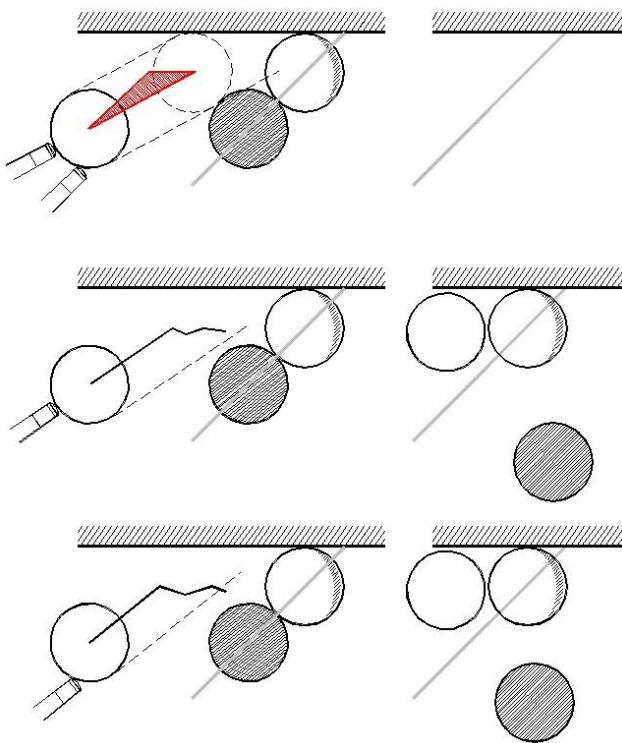


11D Right Hand Side (8/16th).
 Uzing soft rhs iz diffikult to judge, u tend to overhit & the red runs far away az shown, tho the original intention woz to uze rhs to keep the red closer.

11E Right Hand Side (12/16th).
 The red goze a long way, but if **11E** iz played softly a kover iz certain. U need rhs in **11E** koz if u kontakt 12/16th plainball the cannon iz impossible, the yellow iz kissed ahead too far too fast & the qball karnt katch up. If u aim below the hatched zone a cannon aint possible, the qball karnt katchupta the yellow.

11F Plainball (10/16th).
 Probly the best way to get a good leev if u want a nursery. But if **11F** iz played too softly u get touching balls or a cover.

45L 45L (0,0,1)



KISS 12

Three ways of playing a cushion-first cRRcRY kiss cannon Qball level with red & 1ball klier of red.

12A THE BROKEN BALL shows the aim to hit the cushion & red at the same time (a little thicker than 1/32nd ball). Aiming to miss the edge of the red (ie 0/16th) givs cushion-first, aiming 1/16th givs red-first.

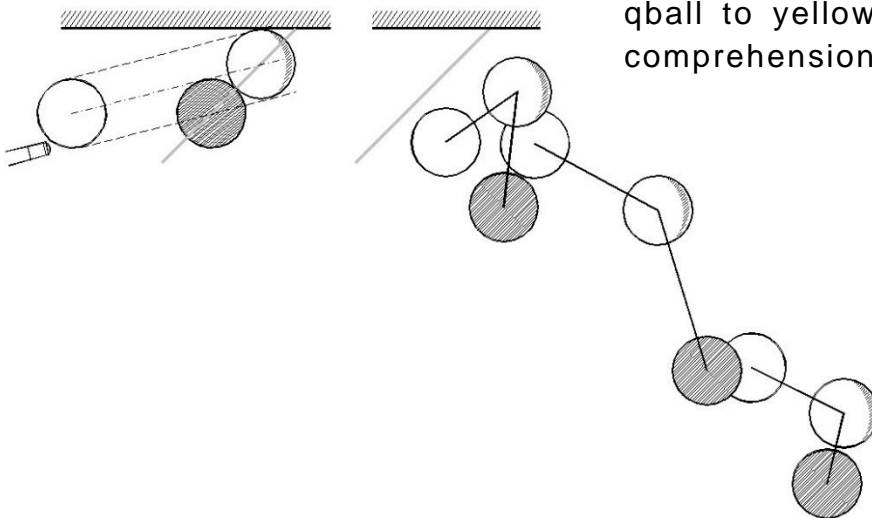
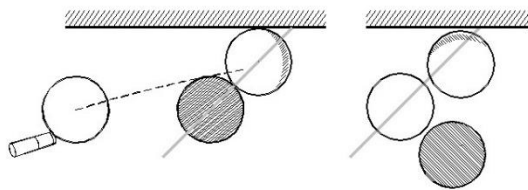
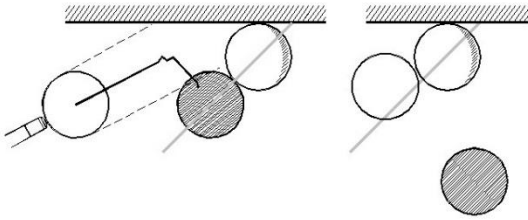
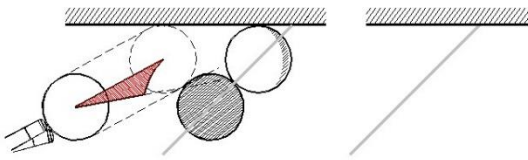
THE HATCHED ZONE shows the range of aims that giv a cushion-first cannon, at the extreme u need rhs (ie running).

12B Plainball (aiming az if to kleen miss the red by 2/16th).
 The shown leev iz good.

12C Right Hand Side (aiming az if to kleen miss the red by 4/16th).
 This kan giv a better leev than in **12B**, but there iz a greater danger of touching-balls or a cover or hitting too hard.

KISS 13

Four ways of playing a red-first RRcRY or RRcY inside kiss cannon.



13A THE HATCHED ZONE shows the range of aims that giv a red-first cannon, at the extreme u need rhs (ie running).

13B Plainball (aiming 1/16th or more). There are two quick kontakts on red sending the red further than u reckon. The leev aint good (az shown).

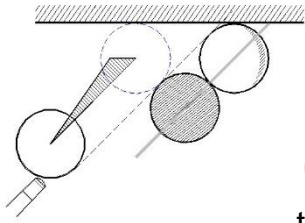
13C Right Hand Side (8/16th ball). Diffikult, but az shown kan giv a goodish leev for a nursery. Kontakt the qball tween 4 o'clock & 5 o'clock hitting downish to get some swerv plus rhs, slowly, aiming say 6/16th to get the dezired 8/16th kontakt.

13D Right Hand Side (8/16th). Here are three more possible sets of leevs when the halfball RRcY cannon iz played slow medium & fast. The three sets of lines join the qball to yellow to red for each leev to help comprehension.

The three leevs show the big difference that pace can make. The slow leev aint good (we hav a thin YcR cannon to get below the red & praps a nursery). Medium iz interesting. Fast kood be good if the side cush iz near. But fast iz fraught, the qball katches up to the yellow a long way down the track & might miss. But its interesting.

45L 30L (0,0,1)

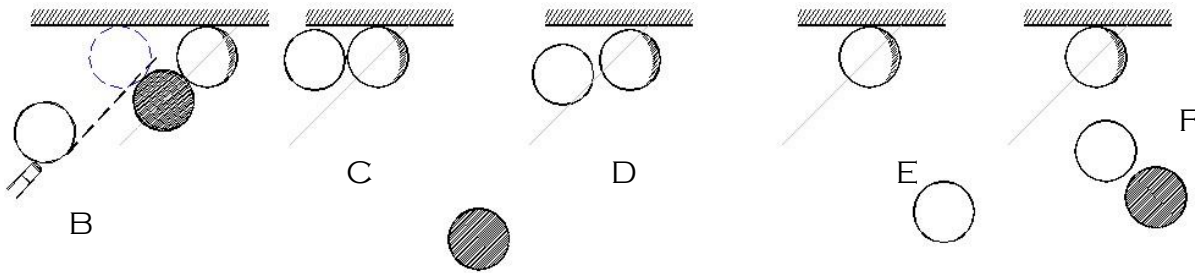
KISS 14



Six results for a cushion-first cRcRY cannon attempt in this pozy, aiming to miss red by 1/16th ball.

14A THE BROKEN BALL shows the aim to hit the cushion & red at the same time (ie 0/32nd ball). Aiming to miss the edge of the red gives cushion-first, aiming to touch the edge of the red gives red-first.

THE HATCHED ZONE shows the range of aims that give a cushion-first cannon. All of these need max rhs (ie running) as shown. Plain ball attempts miss by a mile. Using rhs u get cRRcRY. Its amazing how the widest aim (aiming to miss the red by 3/8th ball) can possibly get a cannon, but it kan.



14B We aim to miss the red by 1/16th ball with max rhs. We need to hit hardish else the qball hits cRRcR but duznt reach the yellow (not shown). But, koz the qball always hits the red twice, the red always goze further than u think (az shown by the leevs shown in **14CDEFG**). Hence u will never get a good leev here (ie when aiming to miss red by 1/16th). And aiming to miss by 2/16th or 3/16th or 4/16th iz worse koz the red goze further (not shown).

14C The yellow didn't moov & the qball ended up touching the yellow or if not touching then covered.

14D Played a bit harder, the yellow mooved along 12mm & the qball ended up well klee, but the red stopped a long way away.

14E Here we accidentally hit the red before the cushion & getting RRcR, the qball missing the cannon on the yellow (ie we didn't get a RRcRY).

14F Here i think the qball hit the cushion & the red at the same time or very nearly, & the qball then missed the cannon on the yellow & followed along closely behind red.

14G Same az in **11F** but with more pace. I don't know how the qball manages to follow so closely behind the red, weird, i might hav a closer look one day. Praps sometimes u might get a touch on the yellow, its difficult for the player to tell, but praps the reff would see.

Anyhow with the yellow & red on a 45 deg angle these kinds of shots are marginal, & a slight difference in the YR angle or the qball kontakt or pace or the amount of rhs kan make a huge difference whether a cannon iz possible, & the leev.

Aiming to miss by 2/16th or 3/16th or 4/16th givs similar problems & the leevs are much worse koz the red goze further (not shown), & covers are more likely too.

Anyhow a thick red-first cannon iz better, ie RRcRY (or sometimes u get RRcYR)(or sometimes u get RRcY) az shown below.

KISS 15

Four ways of playing a red-first RcRY or RcY inside cannon.

15A THE HATCHED ZONE shows the range of aims that give a red-first cannon. All need the max of rhs. Here we show an $1/8^{\text{th}}$ ball kontakt & leev played very softly.

Soft shots with max side invite high jinx (u hit too hard or misscue or get weak side).

15B Here we show a $1/4$ ball kontakt & leev, u kan uze more pace than in A (u get more side & less high jinx). The next shot might be a piqué to get below the red to try for a nursery.

15C Here we show a $3/8^{\text{th}}$ ball kontakt & leev (not bad & not good)(a possible nursery).

The dotted balls show the leev if played with more pace. The qball haz cannoned on the yellow ok but haz passed east of the yellow & the leev aint good for a nursery.

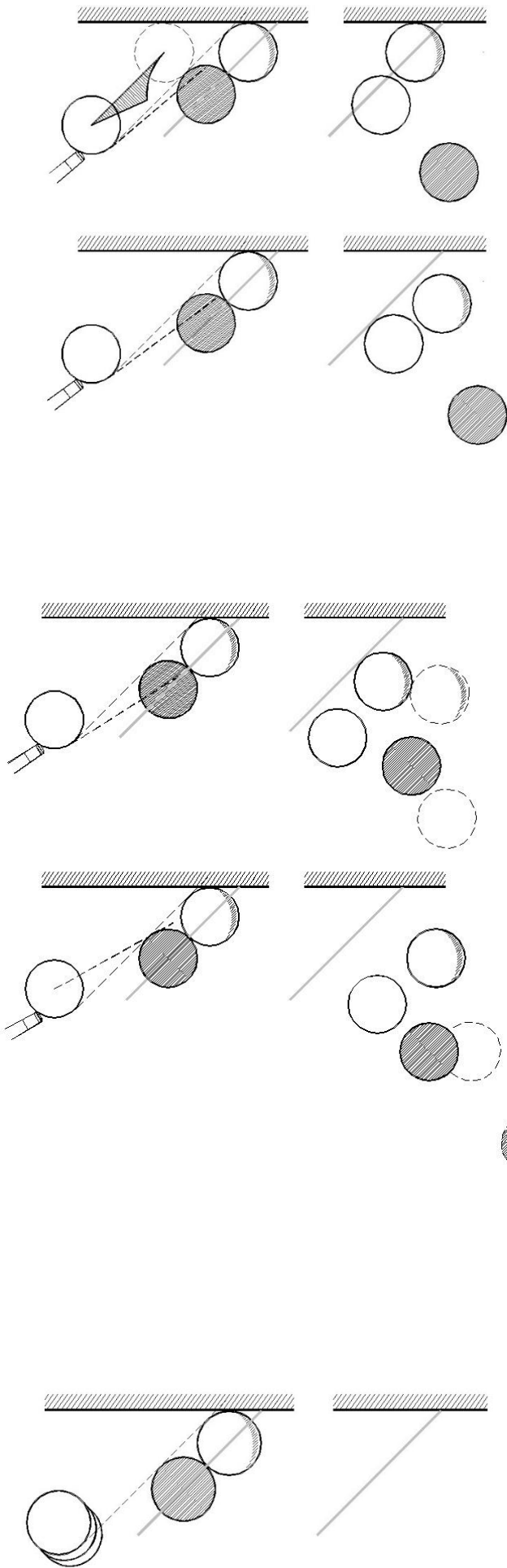
15D Here we show a $1/2$ ball kontakt & leev.

The dotted balls show the leev if played with more pace (interesting) (kood be good if the side cush iz near).

KISS 16

Here we allso show a 2^{nd} qball sitting $1/8^{\text{th}}$ ball inside the tangent line. A red-first RcY cannon is possible.

And we allso show a 3^{rd} qball sitting a $1/4$ ball inside the tangent line. A red-first RcY cannon aint possible (unless u uze a massé)(see later).



45L **L (0,0,1)

Kiss 17 Outside kiss cannons for four qball to red angles. The 4 pairs of dotted balls show where the qball meets the yellow, if the kontakt on red iz perfikt. The 4 black spots show where the red stops. The 4 aim lines show the aims which are a $9/16^{\text{th}}$ & a thin $9/16^{\text{th}}$ & $8/16^{\text{th}}$ & $7/16^{\text{th}}$ on the red. The 2 eezyst kiss cannons here have allready been shown in Kiss 1 & Kiss 2.

The 2 wider margin for error iz miss), hence we are hit too hard just to be cushion cannon (not shown) cannons shown here.

longer range kiss cannons here are a worry, the allmost zero (a little too thick or thin on red & we happy if we get the cannon, plus we will allways sure. Uzing lhs or rhs duznt help. An inside would be safer & better than them 2 outside

In fact the qball closest to the cannon here. Here we are aiming a $9/16^{\text{th}}$ ball on red. Place the qball any iz impossible koz the qball takes

cush iz at the limit for an outside little away from the cush, aiming closer to the cush & the kiss cannon a wider trajectory than the yellow.

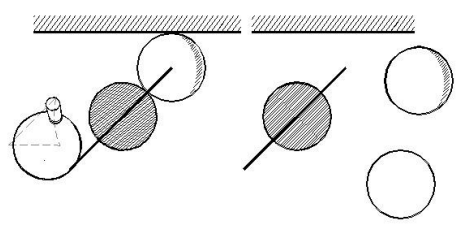
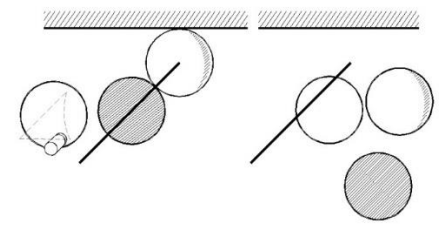
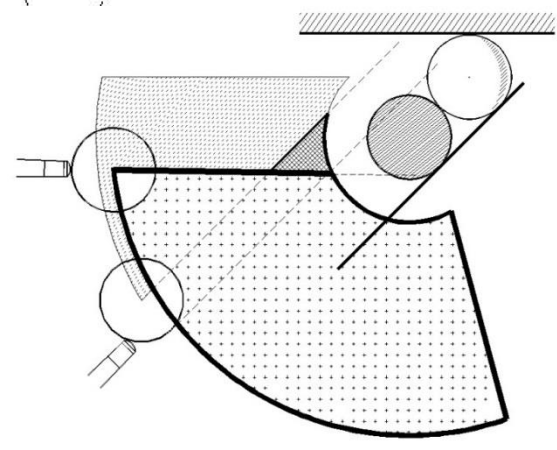
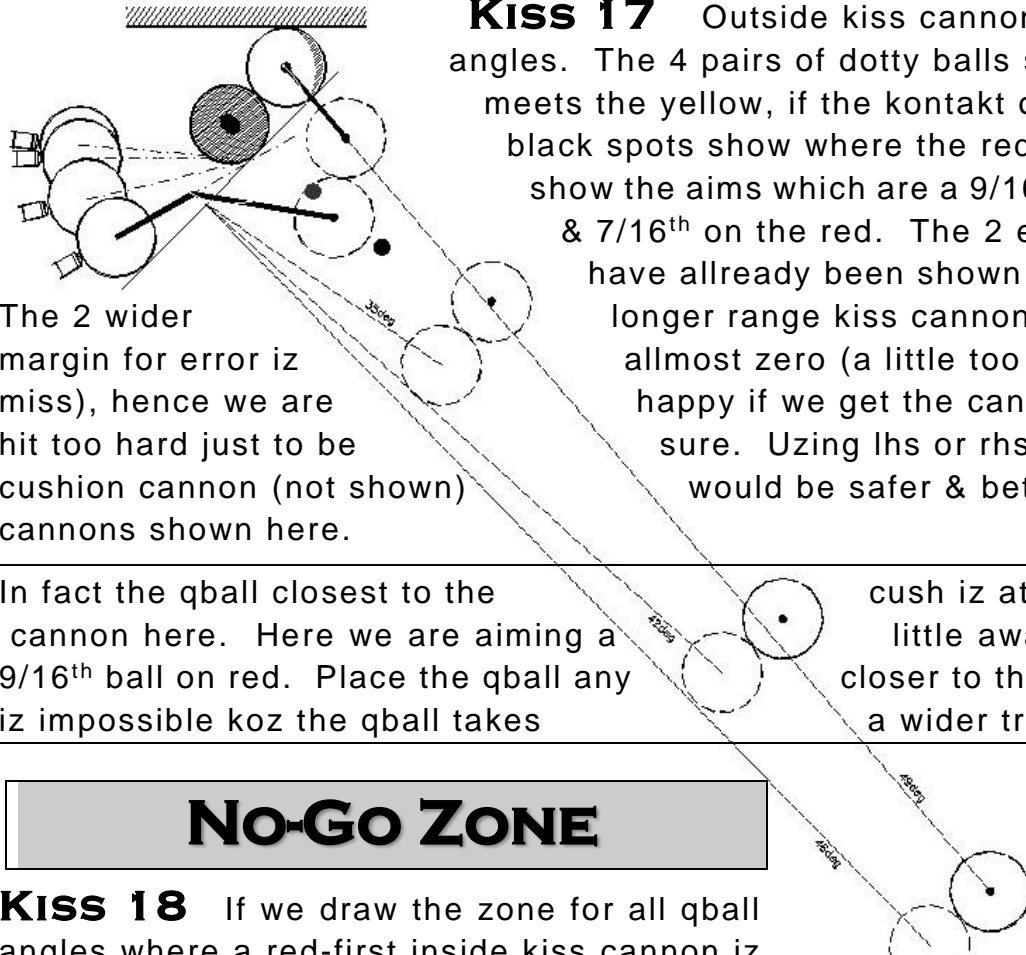
No-Go Zone

Kiss 18 If we draw the zone for all qball angles where a red-first inside kiss cannon iz possible, & the zone for possible red-first outside kiss cannons, then we have an area outside both zones where a kiss cannon aint possible (unless uzing masse), i kall this the no-go zone. Every kiss cannon haz one. Here in 18 the no-go zone for a 45L**L(0,0,*) kiss cannon iz the small triangular area with kross-hatching.

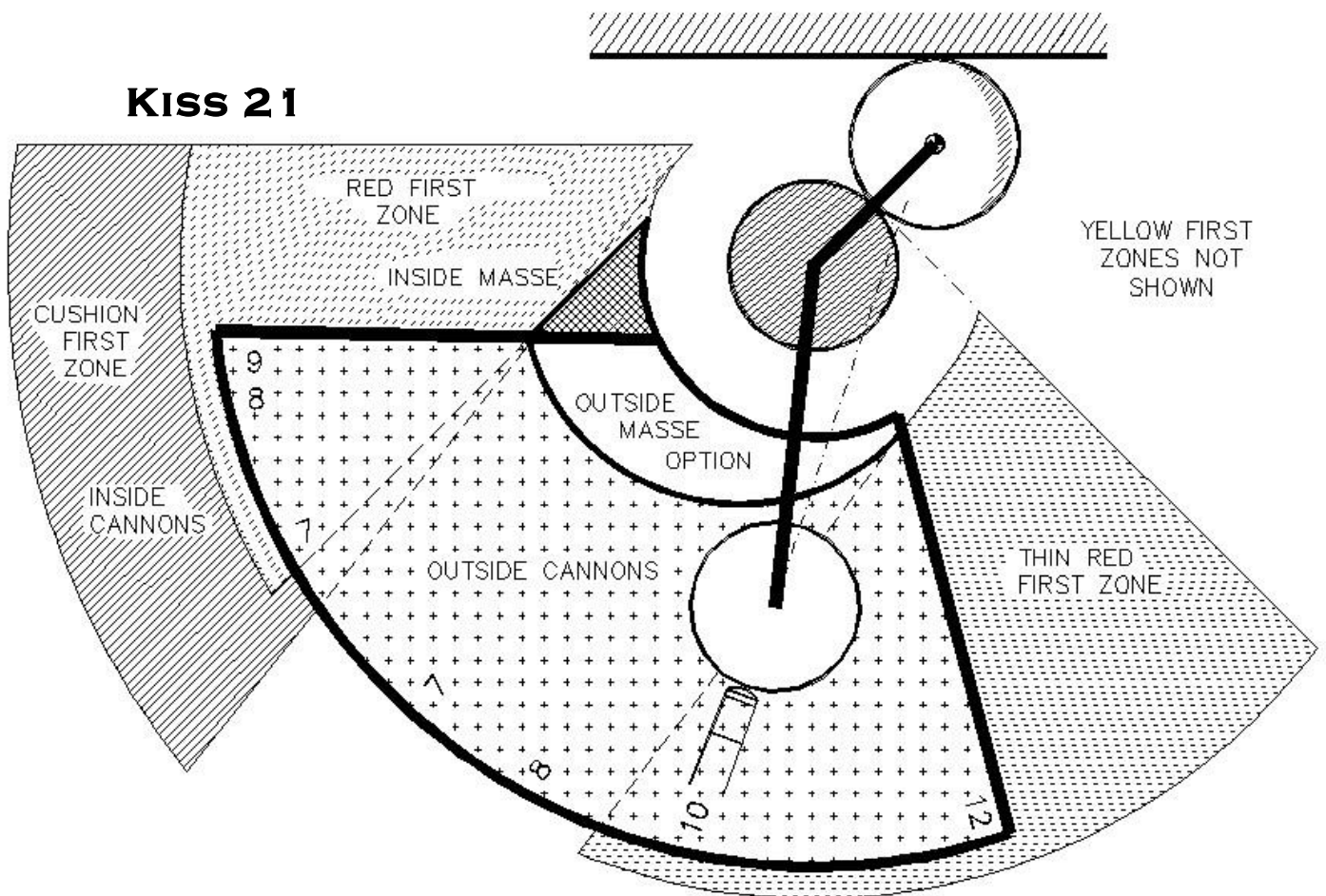
MASSÉS

Kiss 19 In the upper part of that no-go zone u kan uze an eezy soft massé with rhs to get spin off the cush for an inside cushion kiss cannon (RRcY). The leev shown here aint bad for a nursery, but u kood do better.

Kiss 20 In the lower part u kan get an outside kiss cannon uzing massé with lhs. Its best to send the qball well out & hit the red on the way in. In fact a massé might be best even when the qball aint in the no-go zone if the qball iz close to the red. The leev shown here aint good, never iz.



45L *** (0,0,**) ZONE MAP



OUTSIDE CANNONS ZONE The needed kontakts vary from $9/16^{\text{ths}}$ to $7/16^{\text{ths}}$ to $12/16^{\text{ths}}$ as shown. That qball is drawn in prime pozy (45L 39R (0,0,1)) & needs a $10/16^{\text{th}}$ kontakt. Left-hand doglegs need to be hit harder than right-hand doglegs, & more exactly, coz they are longer range. The radii showing the outer limits of zones have no meaning, zones show the angular limits. The eastern limit of the outside cannons zone has little meaning, we can get an outside red-first cannon from further east if we want, but it might not be a kiss cannon (the red might not move the yellow).

INSIDE CANNONS ZONE Here in the cushion-first zone we can play cRRRY cannons. And this zone includes the red-first zone where we can play a thin or thick RRcRY cannon.

THIN RED-FIRST ZONE That drawn qball sits just inside this zone hence we have that option. We need to see at least $1/8^{\text{th}}$ of the yellow (more than you think).

INSIDE MASSÉ ZONE This is the no-go zone, needing a massé. Plus we might need a massé whenever the qball is too close to the red in any zone.

OUTSIDE MASSÉ OPTION Here you can play a plainball kiss cannon, but a massé can give a better leave if you dare.

YELLOW-FIRST ZONES I haven't bothered to deal with yellow-first YR cannons, or cushion-first cYYR cannons, or the area near the cushion close to the yellow where you are snookered & need a massé. Even though most of these are kiss cannons. All of these belong to a different class of kiss cannon, the class where the first object ball kisses the second object ball away from the cushion rather than to the cushion.

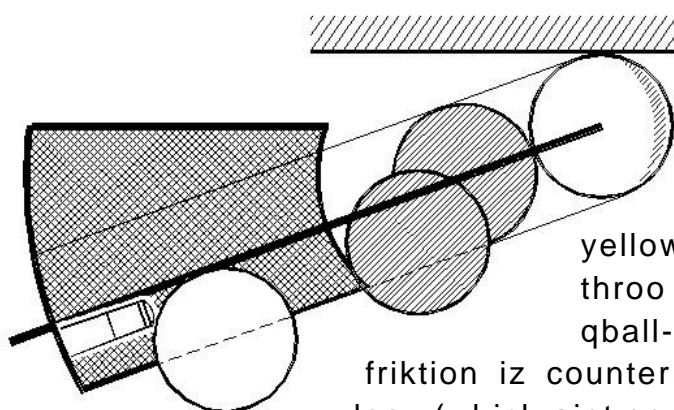
175 POSSIBLE ZONE MAPS

175 ZONE MAPS We use 7 standard slants, each having 5 standard yellow-cushion gaps. Each of these 35 has 5 standard red-to-yellow gaps. That makes 175 standard pozzys for the red & yellow. Thusly we can draw 175 zone maps. On the previous page we looked one such map (45L *** (0,0,**)).

THE *** iz where i would usually write the YRQ dogleg angle for a particular arrangement of the three balls, but it aint relevant to a zone map koz each zone map deals with the full spectrum of dogleg angles, & anyhow the drawn zones show us the angular limits of each zone (hence numbers are superfluous).

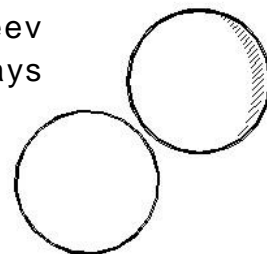
THE ** iz where i would usually write the kleeer qball-to-red range for a particular arrangement of the three balls, but each zone map shows the limits of the ranges (if limits exist) hence these numbers are superfluous. Az i sed earlier, i like to do my tests at a range of 1ball.

20L *** (0,0,**) No-Go Zone



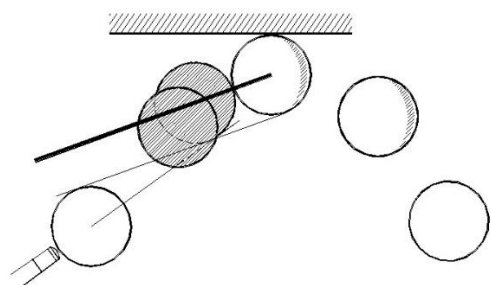
KISS 22

Here we show that a kiss cannon iz possible when the qball sits on the yellow-red tangent-tangent line if u uze lhs & aim 8/16th ball on the red (the red touching the yellow). The lhs usually allows the qball to follow throo narrower koz the lhs reduces the amount of qball-to-red friktion (such reduction of friktion iz counterintuitive). Also shown iz the leev (which aint good here)(u kan get a better leev than this), however at zonal limits u are always happy just to get the cannon.



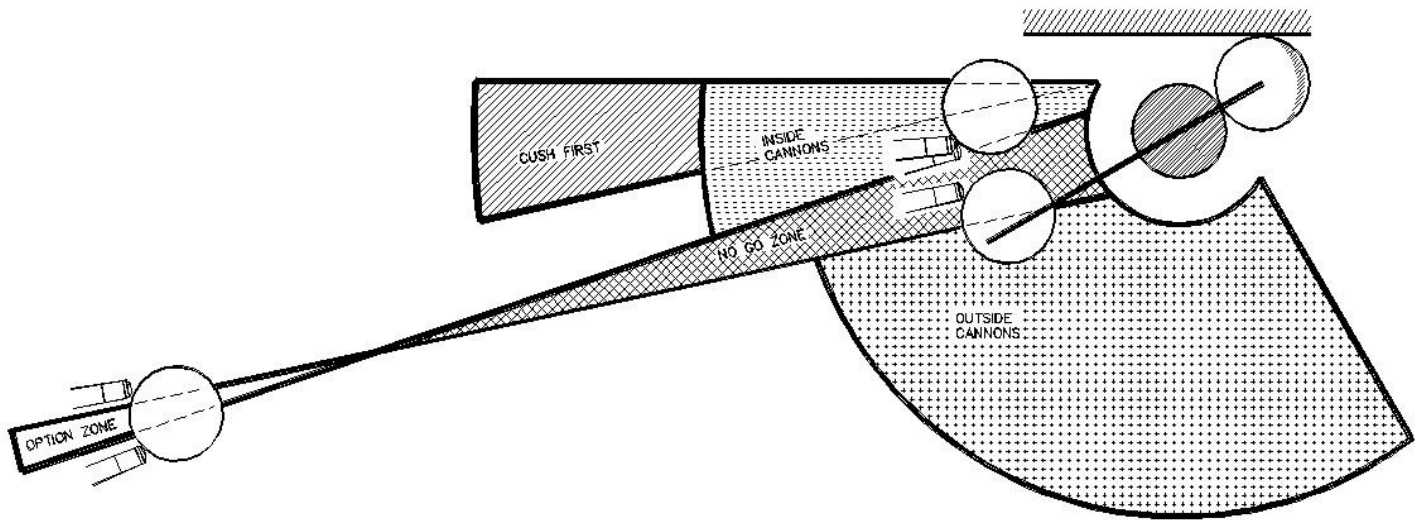
The krosshatched zone iz the no-go zone. It goze all the way up to the cush koz we karnt get any kind of inside cannon. A cush-first cRRcRY or cRRcY cannon aint possible (even if uzing max rhs). And a red-first RRcRY or RRcY cush-cannon aint possible (even if uzing max rhs). Only an outside cannon iz possible (az shown). If u play that outside cannon plainball (instead of uzing lhs) then the no-go zone will extend an 1/8th ball further south for u (not shown).

KISS 23



Here i show the qball a halfball outside the tangent-tangent line. An 8/16th aim givs the goodish leev shown, played plainball az shown (if the pace iz good). When i say goodish i meen u have a chance of salvaging a nursery. Strangely i found that uzing lhs didn't giv a better leev, ie the narrower run-throo deflexion that we get for the qball when uzing lhs made the leev worse here (not shown).

30L *** (0,0,**) No-Go Zone

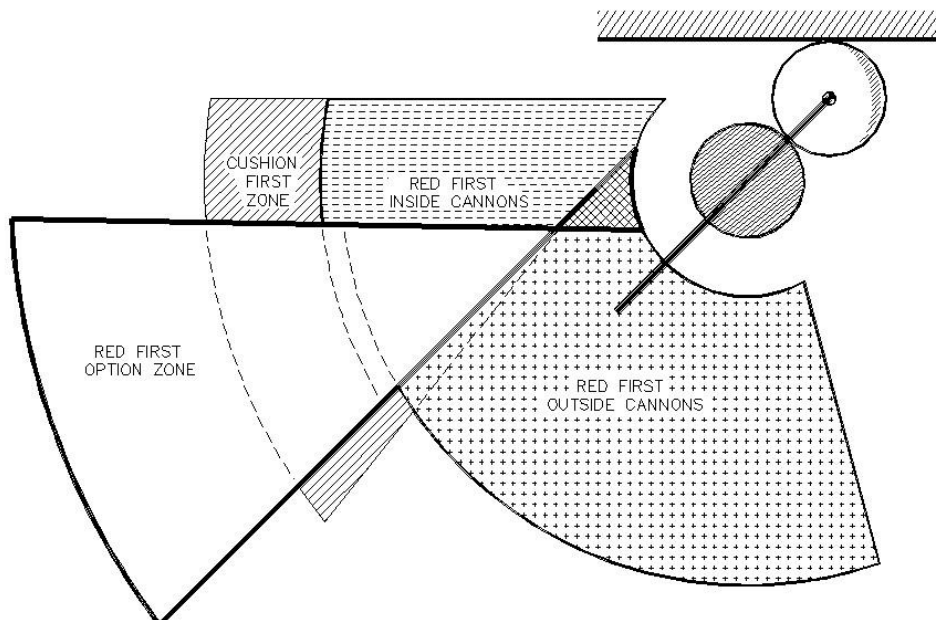


KISS 24 Here are the zones for this 30 deg slant. The qball in the inside cannon zone has the option of a cushion-first cannon (cRRcRY) or a red-first cannon (RRcRY) (or RRcY). The qball at the upper limit of the outside cannon zone needs max lhs & gets the cannon a long way down-range (not shown).

Tween the inside & outside cannon zones is the cross-hatched area which is the no-go zone where a simple kiss cannon ain't possible.

Further out the inside cannon & outside cannon zones merge creating a shared zone (option zone) where you have both options.

45L *** (0,0,**) No-Go Zone



KISS 25 The small triangular cross-hatched area is the no-go zone where a simple red-first kiss cannon ain't possible (not possible inside & not possible outside).

Further out the red-first inside cannons zone & red-first outside cannons zone overlap creating a combined red-first option zone where you have both options.

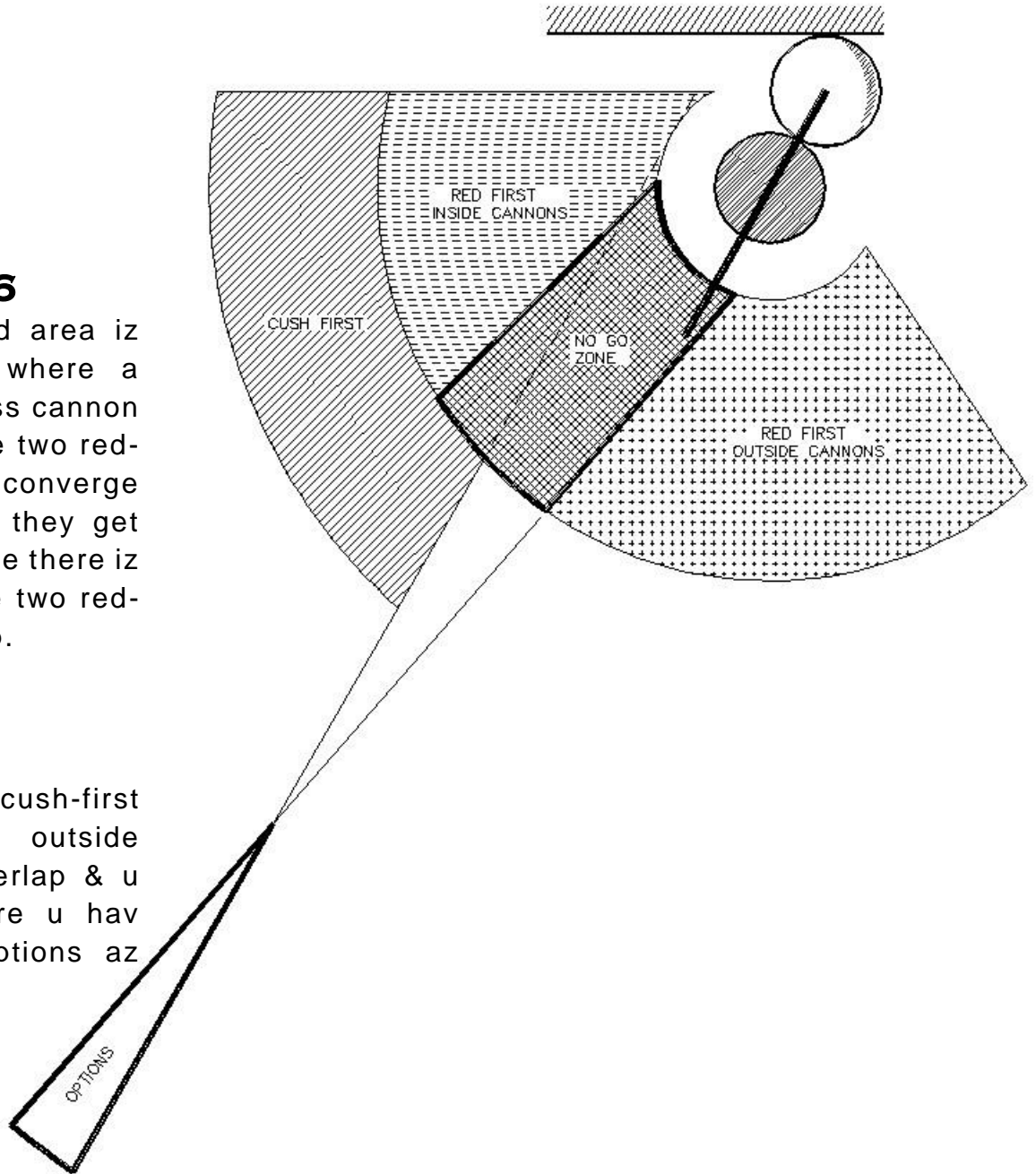
That small no-go zone for 45 deg is probably smaller than for any other slant. Actually the minimum might reside at say 43 deg or 47 deg (not important)(just thinking).

60L *** (0,0,**) No-Go Zone

Kiss 26

The cross-hatched area is the no-go zone where a simple red-first kiss cannon ain't possible. The two red-first zones do not converge at longer ranges, they get further apart, hence there is no area where the two red-first zones overlap.

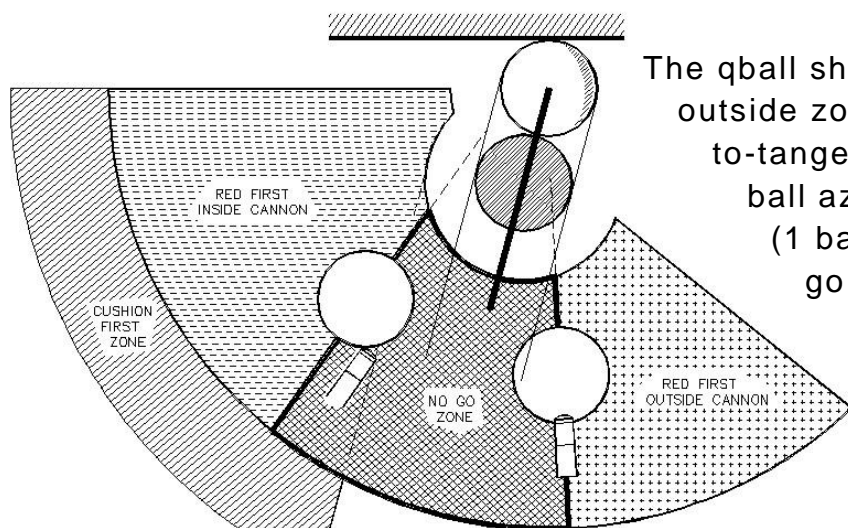
Further out the cushion-first zone & red-first outside cannons zone overlap & you have a zone where you have both of them options as shown.



75L *** (0,0,**) No-Go Zone

Kiss 27A

The qball shown on the limit of the red-first outside zone is $\frac{1}{8}$ ball inside the tangent-to-tangent line as shown, & the aim is $\frac{3}{4}$ ball as shown. At the short range shown (1 ball) lhs or rhs won't reduce this no-go zone. U can have that qball a bit further west if u hit hard & high, but the balls will scatter.



27B Plainball.

Here the qball is touching the tangent-tangent-tangent line. A $\frac{5}{8}$ ball aim as shown can give a goodish leev as shown.

27C Left Hand Side.

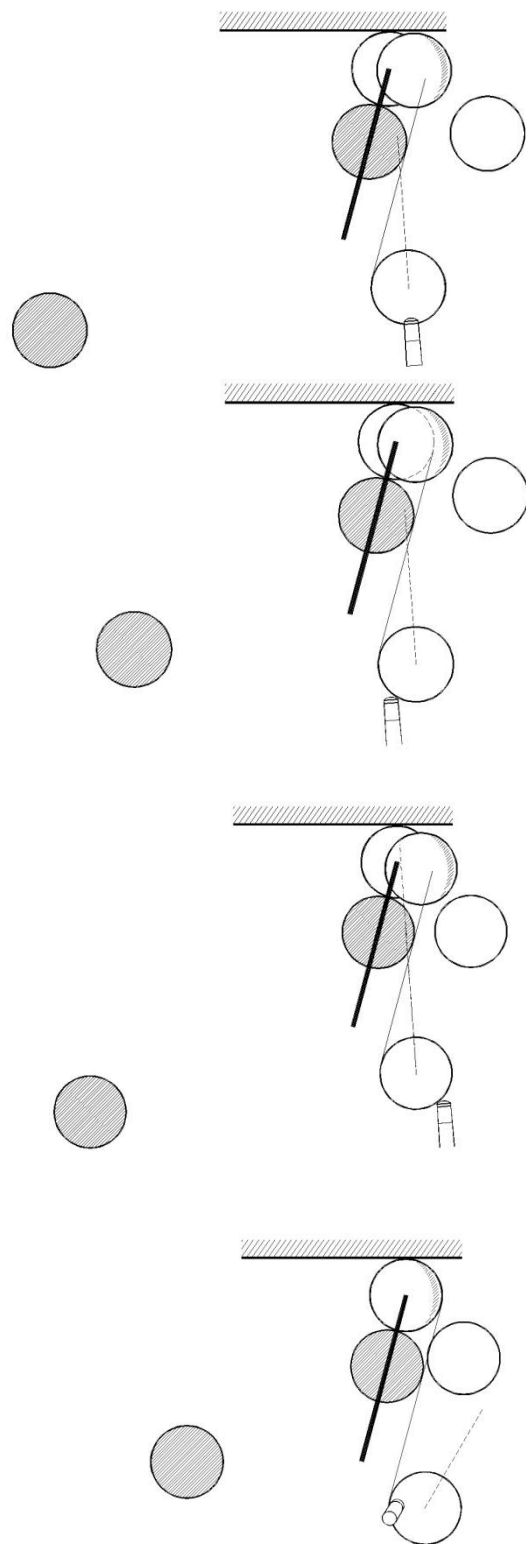
Same pozzly as **B** above. Lhs hasn't helped to get a better leev here. Lhs usually doesn't help if the red & yellow are touching.

27D Right Hand Side.

Same pozzly as **B**. Rhs hasn't helped to get a better leev here. If using rhs u havtabe carefull when the qball is sitting this close to the red coz on a slippery bedcloth u can get unwanted stun.

27E Massé.

Same pozzly as **B**. Masse has given the best leev as shown, or at least the balls are bunched closer together. The yellow hasn't moved. And this kind of masse can be played when the qball is in the no-go zone if close enough to the red.

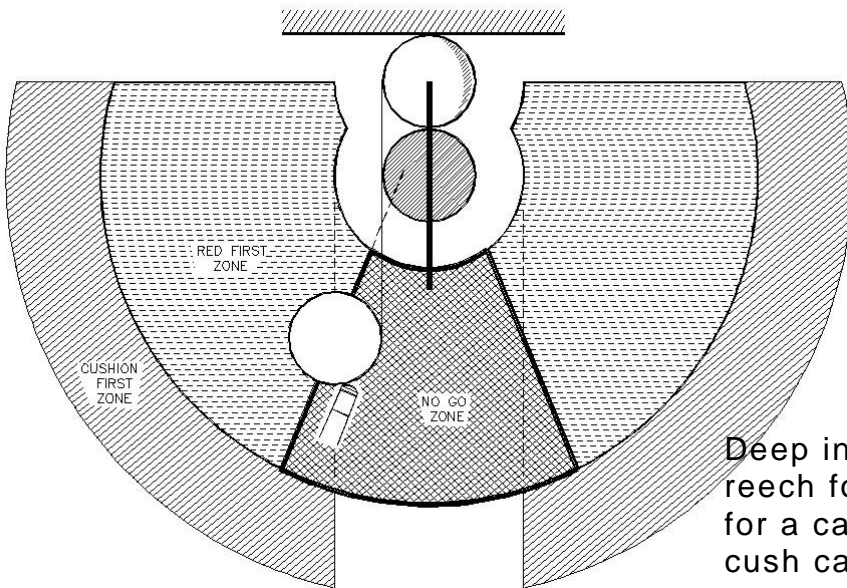


90L *** (0,0,**) No-Go Zone

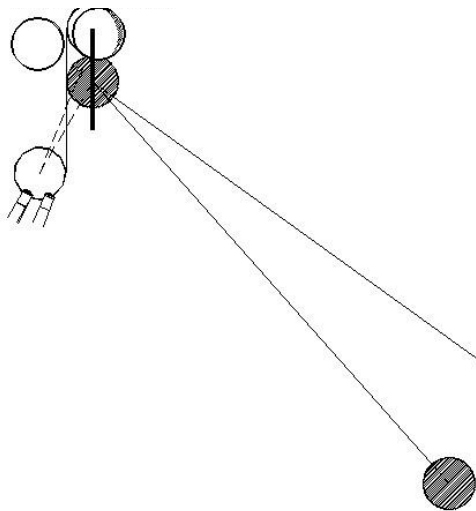
Kiss 28A

The qbball shown is on the limit of the red-first zone & is touching the tangent-tangent-tangent line, & the aim is $\frac{3}{4}$ ball using max rhs as shown. It is RRY, or more truthfully RRRY. Actually this is a surprising cannon, it doesn't feel possible, you expect the qbball to be kissed too far left.

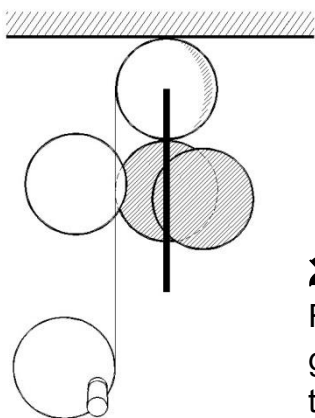
Deep in the no-go zone you probably can't reach for a massé so you will of course try for a cannon off the side cushion, & a side-cushion cannon is probably best in many pozzys if you want a run of nurserys.



28B Here is the resulting leev for the above cannon aiming $\frac{3}{4}$ ball with rhs. As shown the red flies southeast at least 500 mm. The leev shown here is about as good as you can get. Playing softish won't help you to get a better leev, & it risks a kover, so there is no value in getting cute.



28C You can get the above cannon plainball aiming fullball on the red & hitting it at 12 o'clock, but you have to hit hard & the red flies southeast at least 1000 mm as shown here by this farthest red.



28D A massé (RRY or RRcY or RRRY) can give a good leev as shown (here the yellow didn't move).

28E A thin slow swerve can be ok (YcR or cYR), either can give the leev shown. Or you might get RRY or RRcY, it's hard to judge.

